

In the Specification:

Please replace paragraph [0046] with the following amended paragraph:

[0046] Turning to the enclosed figures, FIGS. 1A, 1B, and 1C depict top views of various embodiments of possibly layouts of a layer, or plane, of fiber optic channels, tunnels, or wires to be used within an ASIC. A fiber optic network 9 (See e.g., FIGS. 2, 10, 11), within an IC is made up of one, or more, layers, planes, or grids, denoted by a 10. Single fiber optic fibers 12 make up the grid 10. The fiber optic fibers 12 may be made of any suitable optical transmission medium, either typically now found in IC's or as an added or improved upon feature. For example, the fiber optic fibers 12 may be made of silicon dioxide, glass, etc. As FIGS. 1A, 1B, and 1C all indicate, the fibers 12 may be run in numerous configurations. For example, FIG. 1A and 1B show how the fibers 12 in grid 10 can be parallel or perpendicular to [[itself]] each other, or some combination of the two. FIG. 1C shows that the density of the fibers 12 within 10 can differ, as well, for in FIG. 1C the density of fibers 12 is much higher than in the embodiments in FIGS. 1A and 1B. It should be apparent to one skilled in the art, that there is virtually an infinite variety of grids 10 conceivable wherein the location, density, direction of the fibers 12 can differ and vary.

Please replace paragraph [0047] with the following amended paragraph:

[0047] While FIGS. 1A, 1B, and 1C show a single layer, or plane, 10 of fibers 12, the fibers 12, in the present invention, can traverse across multiple layers within the ASIC, following an essentially vertical configuration, as well. For example, FIGS. 2A and 2B, depict side sectional views of portions of a die, or ASIC, 5. A fiber network comprises the plurality of fiber layers 10. As seen, the optical fibers 12 can traverse the various layers of the die 5 in a plurality

of directions and configurations. For example, FIG. 2A shows a plurality of glass levels 10A, 10B, 10C, 10C made up of optical fibers 12. The glass fibers 12 run in a first direction in the top glass level 10A, as depicted by directional arrow 11A. Conversely, the optical fibers 12 in the bottom glass level 10C run in a second direction, as depicted by directional arrow 11B. Note that directional arrows 11A and 11B run in different directions. The angle between directional arrows 11A, 11B can be 90 degrees, acute, or obtuse. FIG. 2B shows sectional side view of a portion of a die, in this embodiment wherein the glass fibers 12 run in different directions in successive layers, and in the same direction in layers 10A, 10C, or in layers 10B, 10[[C]]D. See, for example, directional arrows 11C, 11D for glass fibers 12 in layers 10A and 10D.

Please replace paragraph [0048] with the following amended paragraph:

[0048] Turning to FIG. 3 which depicts a schematic top view of a portion of a die 5, showing one layer 10 of fibers 12 with associated elements. Located within the fiber layer, or plane 10 are a plurality of drivers 20, or optical transmitters, and optical receivers 30. The optical transmitters 20 and optical receivers 30 are coupled to the fiber layer 10 which is, in turn, connected to the other fiber layers 10 within the ASIC 5. A single fiber layer 10 (if there is only one fiber layer 10 within the ASIC 5) or the plurality of fiber layers 10 thus make up an entire fiber optic network 9 (not shown) within the ASIC 5. A plurality of local fiber optic controllers 40 (e.g., 40A, 40B, See FIG. 4) act as routers and arbiters between the fiber optic channels 10 and a plurality of cores 50 (See FIG. 4) within the ASIC 5. The term core 50 (See e.g., FIG. 4), as used herein, refers to a particular section of logic. The controllers 40 are responsible for choosing an optimal fiber optic channel 12 to reach the destination core 50. The controllers 40 can communicate with a single core 50, or a plurality of cores 50, as well as a pair of optical transmitters 20 and optical receivers 30. The controller 40, along with their respective optical

transmitter 20 and optical receiver 30 can be located as needed on the ASIC 5. For example, a desired location for a particular controller 40 on the ASIC 5 would be where there is a greater need for latency-free communication between cores 50.

Please replace paragraph [0052] with the following amended paragraph:

[0052] FIG. 8 shows a broader view of the detailed connection of FIGS. 6C and 7C and its relationship to a portion of an ASIC 5. Numerous Damascene wires 320 are connected to traditional (i.e., metal) vias 310 amongst the plurality of oxide passivation surfaces 60. As the present invention provides, and FIG. 8 indicates, light 200 transmitting along a fiber 12 from a transmitter [[12]] 20 (not shown) through a bump 15 and on to receiver(s) 30. In so doing, however, the transmitted light 200 is able to readily avoid the various constructs such as the wires 320 and vias 310.

Please replace paragraph [0053] with the following amended paragraph:

[0053] There is a need in the present invention for redirecting the transmitted light 200. One example of a location where this redirection occurs is when transmitted light 200 is required to leave a particularly particular glass layer, or plane 10. Another example of this is when transmitted light 200 must turn, or be redirected, onto a particular, required glass layer 10. Thus, a redirection termination 17 acts much like a reflector of sorts. There are numerous shapes for redirection terminations 17, several depicted in FIGS. ~~10A, 10B, and 10C~~ 9A, 9B, and 9C. The redirection terminations 17 which is made from a reflective material, such as metal, and is configured so as to produce, or allow, a reflection of the transmitted light 200 signal either onto or off of a light level 10. The redirection terminations 17 can be curved, or hemispherical (FIG.

9A), slanted (FIG. 9B), V or cone-shaped (FIG. 9C), or another suitable shape for redirecting the light signal 200. The various redirection termination 17 configurations also offer an advantage of minimizing the transmit strength required for the light source.

Please replace paragraph [0056] with the following amended paragraph:

[0056] Thus, optic transmitters 20 (See e.g., FIG. 4) can direct light signals 200 upwards (or downwards) onto a redirection termination, or dispersion[[,]] device 17, wherein the redirection device 17 scatters the light across the optic plane 10. As a result, all receivers 30 (See e.g., FIG. 4) will be able to detect the transmission. The redirection device 17 can be spherical in shape in order to ensure even dispersal of the light. The receiver 30 can also utilize a lens for light gathering. In order to avoid interference from light reflections and to create signal attenuation, the base of the optic plane(s) 10 can be made, or coated, with a non-reflective material. Thus, the light-absorbing attribute of the base of the optic plane 10 will reduce the number of times a signal reflects around the optic plane 10.